DigiVac

Home of Vacuum Engineering Excellence

Precise Practical Personal

DIGIVAC Model 450

INSTRUCTION MANUAL

Digital Vacuum Gauge and Vacuum Level Controllers

YOU MUST READ THIS MANUAL BEFORE USE

The Digivac Company

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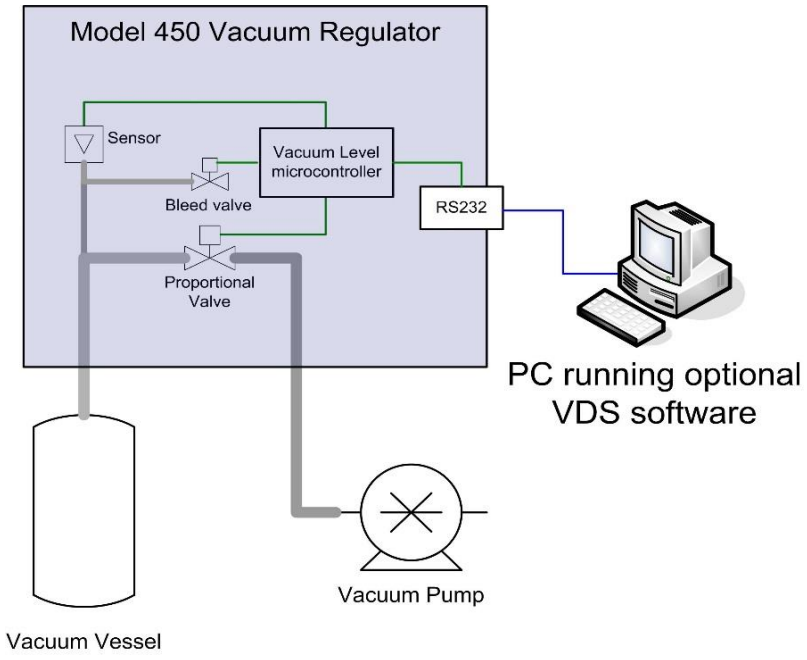
1.0 DESCRIPTION AND PRINCIPLE OF OPERATION

The DIGIVAC Model 450 Digital Vacuum Gauge is a self-contained, vacuum level control unit for maintaining pressures between 2 and 760Torr. This instrument works in conjunction with a precision isolated integrated circuit pressure transducer, and a large bore proportional solenoid valve to measure and control vacuum.

It has a proportional valve that allows the controller to make precise changes in vacuum flow to achieve a very stable vacuum level. The unit has a bleed valve that adds bleed control from atmospheric pressure, or customer supplied gas.

The DigiVac Model 450 operates when the valve opens proportionally from 0 to 100%. The voltage to the valve is controlled by using a PWM (FET transistor pulse width modulating) technique, which allows precise positioning of the valve plunger without developing heat or EMI (electro-magnetic interface.



2.0 CONSTRUCTION

The Model 450 is housed in a vinyl clad metal enclosure. The valves and plumbing are mechanically fastened to the Aluminum plate base. The circuitry and wiring all terminate on a control board, near the display,

It has full manual control available via a dial on the front panel, or can be controlled remotely via RS232.

The Model 450 includes an easy to read, back-lit LCD display with an intuitive readout of the current vacuum level set point, current vacuum level, valve duty cycle, and mode.

3.0 UNPACKING AND INSPECTION

After the DIGIVAC Model 450 is received, it should be carefully unpacked and inspected for damage during shipment and for completeness. In the event of a loss shipment, a claim should immediately be made to the common carrier or the postal service, as applicable.

Each Model 450 should come with:

-A vacuum gauge controller
-An isolated vacuum sensor with enclosures
-An AC adapter that runs on 100-230VAC, 50/60 Hz with line cord
-Pre-tested under actual vacuum against a NIST standard

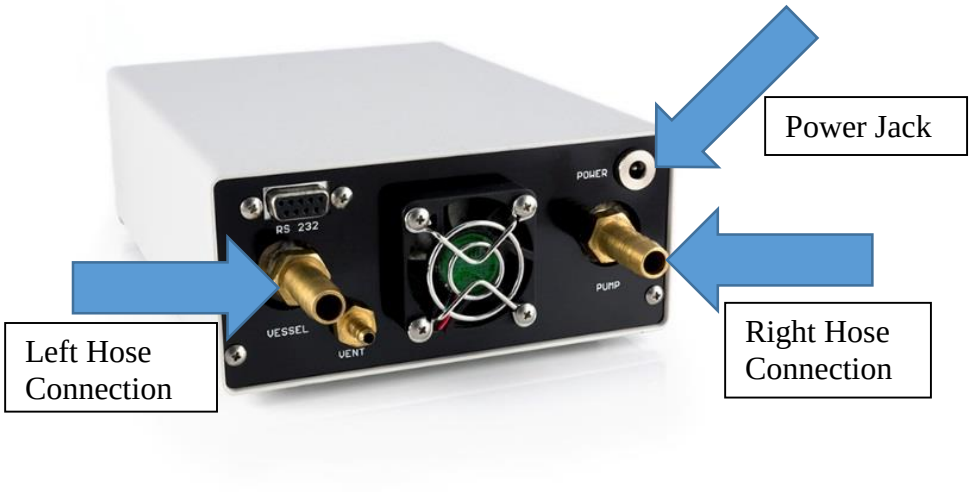
4.0 INSTALLATION

Position the unit as desired and make the following connections:

- Connect the power supply to AC power 115 to 230 volts 50/60/400 Hz.
- Connect the power jack to the rear of the unit
- Connect the Right Hose connection (as seen from the rear of the unit) to the vacuum pump
- Connect the Left Hose connection (as seen from the rear of the unit) to the system

Rack Installation:

The unit may be mounted on racks using the tray fittings available from VWR Scientific and other vendors.

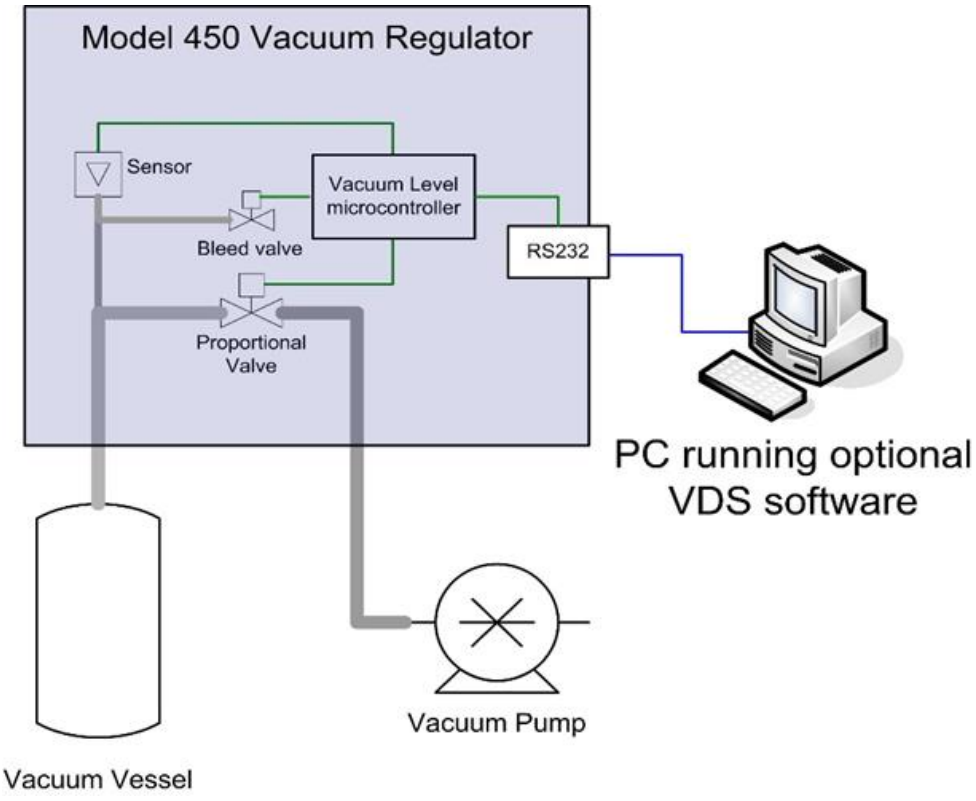


5.0 OPERATION

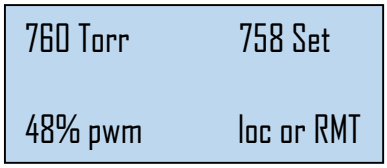
After installation, the instrument is ready for immediate operation. The unit consists of the instrument housing with interface connector. It can be powered with the included external 100/240 VAC power adaptor.

To operate:

- Plumb the unit in between vacuum pump and vessel
- Attach source of bleed air, (if nothing is attached, atmospheric air will be used)
- Place both front panel toggle switches in the center position
- Using the knob, set the desired pressure
- Move the right switch to the up (regulate) position



The unit will now read:



- The first line shows the current pressure and the set point
- The second line shows the percent the valve is open, followed by mode of operation

5.1 SWITCH FUNCTIONS

Controls

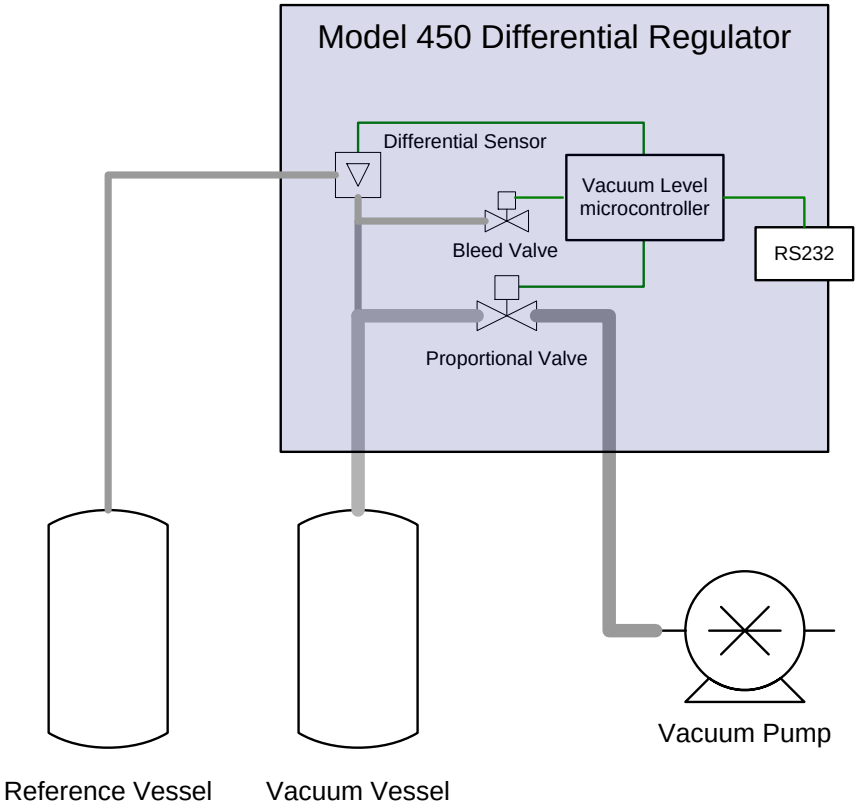
Loc (local control)	Vacuum control will proceed according to the mode of operation
RMT (remote control)	Ignores front panel switch settings

Modes of Operation (right switch)

Regulation (up position)	regulates vacuum according to set point
Off (center position)	standby mode
Full (down position)	opens valve fully regardless of setting

Purge Control (left switch)

Purge Switch	The center position in the normal operation
Ref	Used for custom features, such as the differential control feature
Vent (“up” position)	Placing the switch in the “up” position causes the vent valve to open



5.2 SOFTWARE

The unit comes with 2 different versions of controller software:

1. Software intended for directly connected vacuum pumps that relies on the leak characteristics of the vessel for bleed up, and a proportional valve to control the vacuum applied to the vessel.
   a.) This version of controller software (lanlcdsp.hex) has been shipping with our product since 2002. It is by far the most well deployed vacuum level control software in our portfolio.
   b.) This version of software can have an optional RS232 port either PLC/PC control or the optionally purchased VDC- Valve Controller Digivac Software that allows the user to set 16 vacuum levels and duration to facilitate complex scientific scenarios, and approach a ramp rate.
2. Controller Software 8J22 that is intended for use with vessels that don't leak. It can also be used to test scenarios that use house vacuums.

6.0 SERVICING AND MAINTENANCE

MAINTENANCE

Your vacuum controller should give you many years of trouble free service. There are no regularly scheduled maintenance intervals. If consistent accuracy is required, it is recommended that the gauge, tube and power supple be returned for a yearly calibration check.

6.1 FACTORY REPAIR AND CALIBRATION

The vacuum gauge assembly is designed to provide years of trouble-free service, and the liberal internal use of plug-in components make it easily repairable. No field servicing of the unit is recommended, other than replacement of the gauge tube, but factory servicing and calibration are available at a nominal cost and fast turn-around times.

7.0 NOTES ON CALIBRATION

Each DigiVac vacuum gauge controller is calibrated to the particular vacuum gauge sensor that is shipped with the unit. Send back to factory if the calibration is in question.

8.0 UNDERSTANDING TORR

The DIGIVAC vacuum instrument and many similar instruments are calibrated in microns or "milliTorr." It is appropriate to discuss what microns are and to relate microns to other measures of pressure and vacuum. Microns are not really a measure of vacuum at all, but rather of absolute pressure. It will be recalled that the pressure of the atmosphere is 14.696 or approximately 14.7 pounds per square inch at sea level. This pressure is due to the weight of all of the air in the earth's atmosphere above any particular square inch. This 14.696 psi is equivalent to the pressure produced by a mercury column of approximately 29.92 inches high or .76 meters (about 3/4 of a yard) or 760 millimeters of mercury.

Atmospheric pressure varies greatly with altitude. It decreases approximately 1 inch of mercury per thousand feet of altitude. It also varies widely with local weather conditions. (Variations of one half inch in a single day are common.)

The word vacuum means pressure lower than atmospheric or "suction," but, in describing negative pressure, the atmosphere is only a satisfactory reference if we are dealing with values of vacuum down to about 27 inches of mercury. Below that, it is much more useful to talk in terms of absolute pressure, starting from absolute zero.

The Model 450 measures from 2-760 Torr. One TORR, a commonly used unit, is an absolute pressure of one millimeter of mercury. A milliTorr is equal to one thousandth of a TORR. A MICRON is the same as a milliTorr.

9.0 ACCESSORIES AND MODIFICATIONS

Optional Features:

Options	Description
NISTCal	Calibration of a DIGIVAC vacuum gauge against a NIST traceable standard with data
SS	Makes vacuum path completely composed of stainless steel to reduce effects of a corrosive environment
Differential	Gives the ability to control a differential vacuum level from -3.0 to +3.0 PSI

Please consult the product guide and website for the latest available.

10.0 SPECIFICATIONS

Range	1-760
Units	Torr
Bleed Interface	3/32 inch Silicon I.D Hose
Vac Interface	3/8 inch I.D. Hose
Sensor	Isolated Transducer
Display	LCD Character
Dimensions	2.75" high, 5.5" wide, 7.5" deep
Power	100-240VAC 50/60 Hz CE rated

INSTRUMENT ACCURACY

1 to 5 Torr	+/- 0.5 Torr
5 to 760 Torr	+/- 2 Torr
Regulation Accuracy	+/- 2 Torr
Regulation Repeatability	+/- 0.5 Torr

For repair or recalibration, return gauges to:

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105B Church Street
Matawan, NJ 07747
Ph: 732.765.0900
Fax: 732.765.1800
E-mail: Direct from our website www.DigiVac.com

The DigiVac Company manufactures a complete line of vacuum gauges and process computers. Contact us or your distributor if you wish for further information.
See www.DigiVac.com for our latest offerings

11.0 TERMS AND CONDITIONS

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